



Department of Energy

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DEC 22 1997

DOE-0261-98



**Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590**

**Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911**

Dear Mr. Saric and Mr. Schneider:

**SUBMITTAL OF THE PROJECT SPECIFIC PLAN FOR SAMPLING THE NORTHEAST CORNER
OF AREA 3**

Reference: Letter to Reising from Saric, "Northeast Corner of Area 3 PSP," dated
December 2, 1997.

This letter serves to transmit the Project Specific Plan (PSP) for sampling the northeast corner of Area 3. Copies of this PSP were informally faxed to you on December 12, 1997, so that you would have copies prior to the commencement of sampling on December 15, 1997. Responses to the U.S. Environmental Protection Agency (U.S. EPA) comments (reference) received regarding an earlier version of this PSP have been addressed in this revision to the extent possible.

If you have questions or comments regarding this PSP please contact Kathleen Nickel at (513) 648-3166.

Sincerely,

**Johnny W. Reising
Fernald Remedial Action
Project Manager**

FEMP:Nickel

Enclosure: As Stated

cc w/enc:

T. Schneider, OEPA-Dayton (total of 3 copies of enc)

F. Barker, Tetra Tech

AR Coordinator, FDF/78

cc w/o enc:

EDC, FDF/52-7

**PROJECT SPECIFIC PLAN
FOR PRE-DESIGN INVESTIGATION SAMPLING
IN THE NORTHEAST CORNER OF AREA 3**

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO**



DECEMBER 1997

**U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE**

**(20810-PSP-0001)
REV. 2**

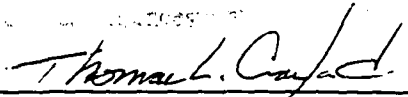
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**PROJECT SPECIFIC PLAN
FOR PRE-DESIGN INVESTIGATION SAMPLING
IN THE NORTHEAST CORNER OF AREA 3**

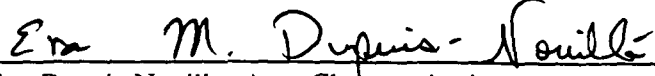
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**Revision 2
December 1997**

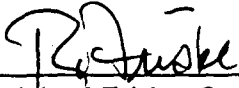
APPROVAL:



Tom Crawford, Area Project Manager
Soil Characterization and Excavation Project
12-12-97
Date



Eva Dupuis-Nouille, Area Characterization Lead
Soil Characterization and Excavation Project
12/11/97
Date



Reinhard Friske, Quality Assurance
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Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

**Fluor Daniel Fernald
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FEMP-A3PSP-NE
Revision 2
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LIST OF ACRONYMS AND ABBREVIATIONS

ASL	analytical support level
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
D&D	decontamination and dismantlement
DQO	data quality objective
FACTS	Fernald Analytical Customer Tracking System
FAL	Field Activity Log
FEMP	Fernald Environmental Management Project
FRL	final remediation level
ICPMS	inductively coupled plasma mass spectrometry
PSP	project specific plan
PWID	Project Waste Identification Document
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
SCEP	Soil Characterization and Excavation Project
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SEP	Sitewide Excavation Plan
TAL	target analyte list
V/FCN	Variance/Field Change Notice
WAC	waste acceptance criteria

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1.0 INTRODUCTION

1.1 PURPOSE

Extensive soil sampling was conducted during the Remedial Investigation (RI) at the Fernald Environmental Management Project (FEMP). The resulting analytical data was input into a solid block model that indicated the need for several deep excavations in the northeast corner of the Former Production Area (Figure 1-1). One of these deep excavations is the result of unbounded subsurface contamination extending east of the former Production Area. In the absence of sufficient data, the solid block models will conservatively estimate the excavation boundary. The purpose of this Project Specific Plan (PSP) is to confirm that subsurface contamination is limited to within the fenceline of the Former Production Area. In addition, the potential need for deep excavations in other areas is indicated by the solid block model and physical anomalies shown in areal photographs. Therefore, it is proposed to conduct a pre-design investigation to better characterize this area based on two objectives, as follows:

- Objective 1: Investigate the possible presence of subsurface (i.e., deep) contamination indicated by the kriged results of the solid block model. The model shows the extent of total uranium contamination along the fenceline of the northeast corner of the Former Production Area (proposed Borings 12243 through 1249) and within the northeast corner (proposed Borings 12243, and 12250 through 12252).
- Objective 2: Identify if there is possible subsurface contamination associated with the physical anomalies indicated on the aerial photographs (proposed Borings 12253 through 12263).

1.2 SCOPE

Surface and subsurface soil samples will be collected from 22 locations designated in the northeast corner of the Former Production Area (Figure 1-1). At each location, selected sample intervals from the soil core will be collected for total uranium analysis. During a previous geotechnical investigation conducted in this area, several samples were collected from a soil boring to a maximum depth of 24 feet, then analyzed for total uranium. This data will be used to supplement the data collected under this PSP to establish a new solid block model for the designed extent of excavation in the northeast corner. This pre-design investigation is consistent with section 3.1.3 of the Sitewide Excavation Plan (SEP).

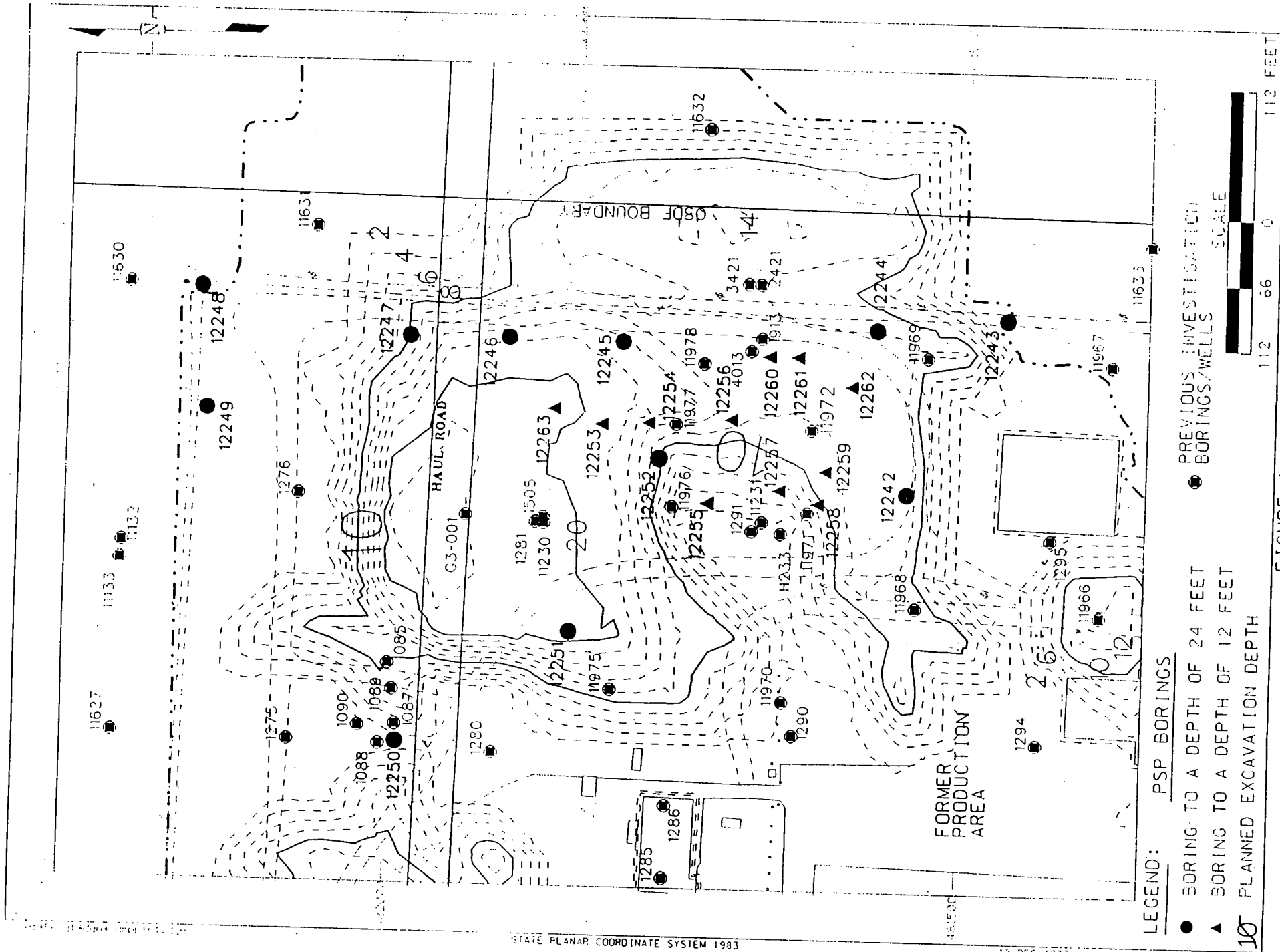
Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ),
Section 3.1 of the SEP and Data Quality Objective (DQO) SL-048, Rev. 1 (see Appendix A).

1.3 KEY PERSONNEL

Key Soil Characterization and Excavation Project (SCEP) and Environmental Monitoring personnel responsible for performance of the project are listed in Table 1-1.

**TABLE 1-1
KEY PERSONNEL**

TITLE	PRIMARY	ALTERNATE
DOE Contact	Kathi Nickel	Rob Janke
Area 3 Project Manager	Tom Crawford	J. D. Chiou
Area 3 Characterization Lead	Eva Dupuis-Nouille	Tom Crawford
SCEP Sampling and Characterization Manger	Joan White	Mike Frank
Field Sampling Lead	Mike Frank	Tom Buhrlage
Surveying Lead	Jim Schwing	Dean Shanklin
Waste Disposition Contact	Ken Belgrave	Linda Barlow
Waste Acceptance Operations	Steve Reutcke	---
Laboratory Contact	Al Bacon	Bill Westerman
Data Validation Contact	Jenine Rogers	Jim Cross
Data Management Contact	Valerie Huff	Susan Marsh
Quality Assurance Contact	Reinhard Friske	Harold Swiger
Health and Safety Contact	Lewis Wiedeman	---



STATE PLANAR COORDINATE SYSTEM 1983

12-DEC-1997

2.0 SAMPLING PROGRAM

Soil samples will be obtained from soil borings to a depth of 24.0 feet at soil boring locations 12242 through 12252 to determine the presence of total uranium above final remediation levels (FRLs) in this area. In addition, selected soil borings to be drilled to a depth of 12.0 feet (Borings 12253 through 12263), were located based on aerial photographs where physical anomalies are indicated. A review of the Glacial Till Map (OU5 RI Plate 3-3) shows that the glacial till is over 30 feet deep in this area; therefore, no boring will penetrate the underlying Great Miami Aquifer.

Appendix B identifies the proposed boring locations and the sample intervals to be analyzed from each boring. Lithologic descriptions will be conducted on the cores and recorded on a lithologic log by the project geologist.

2.1 CORING AND SOIL SAMPLE COLLECTION

Prior to drilling, each boring location will be surveyed. The 1983 state planar Northing and Easting coordinates, along with surface elevations, will be noted, and the location will be identified in the field with a flag showing the location number. Soil borings will be drilled using the Geoprobe® Model 5400 in accordance with EQT-06, *Geoprobe® Model 5400 - Operation and Maintenance*. If the Geoprobe® is unavailable, an auger drilling rig may be used to conduct the required borings in accordance with DRL-02, *Solids Sampling in Drilled Boreholes*. Refer to Section 2.1.1 for details of Geoprobe® sampling, and Section 2.1.2 for details of auger drilling rig sampling.

During the sample collection process and final borehole abandonment, work stoppages will be minimized or eliminated to prevent potential migration of perched groundwater. Additionally, sampling and abandonment of any individual borehole will be completed on the same work day to the extent practical. Borehole collapse will be monitored after each core retrieval to account for possible soil "fall-in" during soil sample collection when feasible.

The soil core from each boring will be marked off in 1-foot intervals when it is retrieved from the borehole. Analytical results of the 6-inch sample portion that is collected from each one-foot interval will be representative for the entire foot to address solid block modeling needs. The 6-inch sample will be biased to the portion of the highest potential zone of radiological contamination within the one-foot interval of the soil core using the following sample selection criteria:

1. Cores will be radiologically scanned with a beta/gamma frisker to determine gross levels of radiological activity along the core length. Results from the field scans conducted on the cores will also be noted on the sample collection log and the lithologic log. The 6-inch sample will be collected from the highest beta/gamma results in each one-foot interval of the soil core. If the one-foot interval of soil core yields background levels, selection of the 6-inch interval for analyses will then be based on the field geologist's observations for the highest relative permeable 6-inch interval. If no variability in permeability is evident then the top six inches of the one-foot core interval will be selected. Any soil core interval that is not designated for sampling in Appendix B, but exhibits radioactivity greater than 100 corrected counts per minute (ccpm) will be archived using a 6-inch interval (out of each one-foot interval) containing the highest activity. The field geologist will also have the option to collect samples for analyses that are not identified in Appendix B from coarse-grained zones, which by their porous nature may allow contaminants to migrate horizontally through the soil.

2. The field geologist will describe each soil core and document the depth and description on a lithologic log, taking note of sand lenses or coarse-grained material which by their porous nature may allow contaminants to migrate horizontally through the soil.

A photoionization detector (PID) will be used to monitor the soil cores for volatile organics. Results of this survey will be recorded on the lithologic log and the sample collection log.

Each sample will be assigned a unique sample identification number according to Section 2.3, and as listed in Appendix B. If any samples are to be split with the regulatory agencies, the samples to be split must first be homogenized.

In addition to the total uranium samples, archive samples will also be collected from sample intervals designated in Appendix B for Borings 12245 through 12248. Since the total uranium sample and archive sample will be collected from the same 6-inch core, each will be created by splitting the core longitudinally to collect the necessary volume or mass specified in Table 2-1. Field homogenization of the samples collected from these borings (12245 through 12248) is not necessary. Each sample will be assigned a unique sample identification number according to Section 2.3, and as listed in Appendix B. If any samples are to be split with the regulatory agencies, the samples to be split must first be homogenized.

If soil sample recovery is poor or limited over the selected sample interval (Appendix B), the field geologist may designate an immediately adjacent sample interval for analysis, and note this change on the sample collection log. If the designated sample is not immediately adjacent to the designated interval, this change must be noted on the field activity log (FAL) and on a Variance/Field Change Notice (V/FCN) form. If surface or subsurface obstacles prevent sample collection at any of the original locations identified in Appendix B, the location may be moved up to three feet in radius from the original location, and the distance and direction moved will be noted on the FAL. If the new location is greater than three feet away from the originally planned sample point, the change will be documented on a V/FCN form, and the new location will be resurveyed. A magnetometer survey must be performed at each planned boring location to ensure no buried ferrous materials are detectable. Any additional samples designated for analysis by the Characterization Lead or the field geologist will also be assigned a unique sample identification number according to Section 2.3 of this PSP, and documented on a V/FCN form.

Customer sample numbers (Appendix B) and Fernald Analytical Customer Tracking System (FACTS) identification numbers will be assigned to all samples collected and submitted to the laboratory. The sample labels will be completed with sample collection information, and technicians will complete a FAL, Sample Collection Log, and Chain of Custody/Request for Analysis, which are to be completed in the field prior to submittal of the samples. Samples collected under this PSP will be taken to the controlled side of the on-site laboratory for processing due to their uncertain composition. At least weekly, a copy of all daily sampling logs will be sent by the field personnel to the Characterization Lead.

2.1.1 Geoprobe® Sampling

When possible, soil sampling will be accomplished using a Geoprobe® Model 5400 with either: 1) a dual tube core sampler, designed to minimize downward migration of contaminants from zones of perched groundwater, or 2) a standard core sampler (Macro-core®) if perched groundwater is not present. The dual tube core sampler consists of an outer casing, a cutting shoe, a 1 3/8-inch wide outside diameter inner plastic liner, and inner probe rods to secure the plastic liner. The entire assembly will be advanced into the soil as one unit in approximately one- to four-foot increments, with the soil core being retrieved after each increment. A field geologist will provide direction on sampler selection and the sampler advancement increments to maximize soil core recovery for sampling and

lithological descriptions. If refusal is encountered during core sampling, one additional attempt to complete the borehole in an adjacent location may be attempted. The location for the second boring attempt will be based on a magnetometer survey to confirm that no buried ferrous materials are detectable.

2.1.2 Auger Drilling Rig Sampling

If the Geoprobe® is unavailable, soil sampling will be conducted using a truck-mounted hollow stem auger drilling rig. If perched water is present, a dual casing method will be used to prevent downward migration of the perched water. Samples shall be collected continuously from each boring to the specified depth. All soil samples will be collected with a split barrel sampler.

2.2 BOREHOLE ABANDONMENT

Each borehole formed by the Geoprobe® will be plugged using bentonite pellets or a bentonite grout slurry immediately following completion of sampling. If pellets are used, they will be placed in the borehole in two foot intervals, then hydrated with potable water. If boreholes are formed using the auger drill rig, borehole abandonment will be completed in accordance with Appendix J of the SCQ. The field geologist will direct the field team on which abandonment option will be used. A borehole abandonment log will be completed for each borehole.

2.3 SAMPLE IDENTIFICATION

Each sample will be assigned a unique sample identification number, as follows:

A3NECOR-Boring-Depth ID-QC, where:

A3NECOR = Sample collected for Remediation Area 3 northeast corner investigation

Boring = Boring number

Depth ID = Sample depth identification based on one-foot increments. This number represents the maximum depth of the one foot sample, i.e. the 0'-1' sample = "1", the 1'-2' sample = "2", and so on.

QC = Quality control sample. A "D" indicates a duplicate sample if applicable. A "X" indicates the Rinsate sample.

Note: An archive sample will be designated with a "-V" suffix on the sample ID.

The single rinsate sample will be identified as A3NECOR-*boring number* X. The rinsate sample will be collected between borings, and the assigned *boring number* in the sample name will match the subsequent boring number.

2.4 SAMPLE ANALYSIS

The necessary volume of all samples collected will be prepared for ICPMS analysis according to SW846. All samples will be analyzed by the on-site laboratory at analytical support level (ASL) B. Refer to Appendix C for the Target Analyte Lists (TALs). Note that total uranium will be calculated from uranium-238 using standard isotopic ratios. Table 2.1 identifies the sampling and analytical requirements. The remaining portion of all samples analyzed for lead (the 0'-1' and 1'-2' samples) will be archived and refrigerated at the on-site laboratory for possible future analysis to support a future investigation of potentially characteristic areas in Area 3. If analyzed, the analytical requirements will be identified in the scope of the PSP for the Area 3 Investigation of Potentially Characteristic Areas.

TABLE 2-1
SAMPLING AND ANALYTICAL REQUIREMENTS

ANALYTE/ TAL (Appendix C)	METHOD	SAMPLE MATRIX	LAB	ASL	PRESERVE	HOLDING TIME	CONTAINER
Total Uranium/ TAL A	ICPMS	Solid	On-site	B	None	6 months	500 ml Glass or Plastic
Total Uranium/ TAL A	ICPMS	Liquid/Rinsate	On-site	B	HNO ₃ to pH < 2	6 months	1 liter polyethylene
Archive Sample	NA	Solid	NA	NA	None	6 months	500 ml Glass or Plastic

Note: The minimum mass for the total uranium sample and archive sample is 50g and 100g, respectively. Additional samples may be collected on behalf of the regulatory agencies (minimum mass of 150g). Also, a 10g (minimum) alpha/beta screen sample will be necessary for each regulatory agency sample.

3.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

3.1 QUALITY CONTROL SAMPLES

Per the SCQ and DQO SL-048, Rev. 1 requirements, all samples will be analyzed to ASL B. The ASL B package will include a Certificate of Analysis and all associated quality assurance/quality control (QA/QC) results. In addition, 10% of the data will be validated to level B. Duplicate samples will not be required. The field geologist will select one rinsate sample. Rinsates will be collected from cutting shoes or split barrel samplers per SMPL-21. No trip blanks will be collected since volatile organics are not a target analyte.

3.2 PROJECT REQUIREMENTS FOR SURVEILLANCES

Independent assessment will be performed by the FEMP Quality Assurance (QA) organization by conducting surveillances. Surveillance will consist of monitoring/observing on-going project activity and work areas to verify conformance to specified requirements. Surveillances will be planned and documented in accordance with Section 12.3 of the SCQ.

3.3 CHANGES TO THE PROJECT SPECIFIC PLAN

Prior to the implementation of changes, the signatories of this PSP or their designees will be informed of the proposed changes. Once verbal approval (electronic mail is acceptable) has been obtained from the signatories of this PSP, the changes may be implemented. Changes to the PSP will be noted on a V/FCN. QA must receive the completed V/FCN within seven days of granting the verbal approval.

3.4 PROCEDURES AND MANUALS

To assure consistency and data integrity, field activities in support of the PSP will follow the requirements and responsibilities outlined on controlled procedures and guidance documents, such as:

SMPL-01, *Solids Sampling*

SMPL-21, *Collection of Field Quality Control Samples*

SOP 766-S-1000, *Shipping Samples to Off-site Laboratories*

EQT-04, *Photovac Microtip Photoionization Detector - Calibration, Operation and Maintenance*

EQT-06, *Geoprobe Model 5400 Operation and Maintenance Manual*

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EQT-05, *Geodimeter 4000 Survey System - Operation, Maintenance and Calibration*

DRL-02, *Solids Sampling in Drilled Boreholes*

Sitewide CERCLA Quality Assurance Manual

Sitewide Excavation Plan

4.0 EQUIPMENT DECONTAMINATION

Field Technicians will ensure that sampling equipment is clean prior to transport to the sample field site. Equipment will be decontaminated or cleaned between collection of sample intervals, and again after the sampling performed under this PSP is completed, according to the methods below.

Sampling equipment that comes into contact with media to be sampled will be decontaminated to Level II. For the Geoprobe® operation, only the cutting shoe will require a Level II decontamination, which will be performed at the sampling site. The probe rods, casing and casing threads will be wiped down to remove visible soil using towels and brushes as necessary. The sample liners used for sample core collection are pre-cleaned by the manufacturer. If an auger rig is used, the drill augers will require a Level I decontamination in the field or at the decontamination and dismantlement (D&D) Facility by the drilling contractor. The split barrel sampler will require a Level II decontamination.

Decontamination is performed to protect worker health and safety, and also prevent the introduction of contaminants from sampling equipment to subsequent soil samples. Clean disposable wipes may be used to replace air drying of the equipment.

5.0 HEALTH AND SAFETY

All personnel involved in Geoprobe® or drilling operations will read and abide by permits approved by Utility Engineering, Industrial Hygiene, and Radiological Control. Each team member operating in the field will read and sign applicable safety permits prior to initiating assigned project duties. The Field Lead will ensure that each team member performing field activities under the scope of this project is required to read the applicable survey and permits that protect worker safety and health. Personnel who do not read, concur, and sign these documents will not participate in the execution of field activities related to the assigned project responsibilities. A copy of applicable safety permits and surveys issued for worker safety and health will be posted at each field location. At the completion of the project, the completed forms will be submitted for incorporation into the project record files.

If sampling is conducted using an auger drilling rig, a Project Health and Safety Matrix will be prepared. All personnel will be briefed to the Matrix prior to initiation of sampling, and will indicate their compliance by signing the briefing form.

In the event that the soil is found to exceed 100,000 disintegrations per minute, the soil will be handled as high level waste. The handling and disposal of this waste will be consistent with RP-0007, *Radiological Posting and Access to Radiological Areas*.

6.0 DISPOSITION OF WASTES

During completion of sampling activities, field personnel may generate small amounts of soil, water, and contact waste. Management of these waste streams will be coordinated with SCEP Waste Disposition Support Services through the Project Waste Identification Document (PWID) process. Soils will be spread at the point of origin, i.e., sampling locations. Generation of decontamination waters will be minimized in the field, and whenever possible, equipment will be decontaminated at a facility that discharges to the Advanced Wastewater Treatment facility, either directly or indirectly, through the stormwater collection system. Decontamination waters generated in the field will be containerized. Contact waste generation will be minimized by limiting contact with sample media, and by only using disposable materials which are necessary. This waste stream will be evaluated against dumpster criteria during the PWID process. If it does not meet these criteria, an alternative disposition will be identified. Additional waste disposition issues are covered in PWID 459, developed specifically for this PSP.

7.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed to satisfy data end use requirements after completion of the field activities. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on the FAL which should be sufficient for accurate reconstruction of the events at a later date without reliance on memory. Sample Collection Logs, Lithologic Logs, and Borehole Abandonment Records will be completed according to protocol specified in Appendix B of the SCQ and in applicable procedures. These forms will be maintained in loose-leaf form and uniquely numbered following the field sampling event. In addition, a copy of completed forms will be sent to the Area 3 Characterization Lead on at least a weekly basis.

Field documentation, such as the FAL, Sample Collection Log, Lithologic Log, and Borehole Abandonment Record will undergo an internal QA/QC review by the Sample Technicians. A second QA/QC review of the records will be performed by FEMP QA personnel. Copies of the records will then be generated and delivered to data entry personnel for input into the Oracle System.

A list of planned sample points and associated locations will be entered into the Soils Master List by the data manager. This table serves as the starting point for tracking sample data. All analytical data will require a Certificate of Analysis. In addition, 10% of the data will require all QA/QC results and will be validated to level B. Data will be entered into the FACTS, then transferred to the Sitewide Environmental Database by Analytical Data Management personnel according to standard protocol. Hard-copy data reports and documents are kept in permanent storage in the Project files. The data management lead will also review all project data to ascertain if the newly generated data meets the data quality specified in the applicable DQO, SL-048, Rev. 1.

APPENDIX A

DATA QUALITY OBJECTIVES SL-048, REVISION 1

Control Number _____

Fernald Environmental Management Project

Data Quality Objectives

Title: Delineating the Extent of Constituents of Concern in Pre-design Investigation and Remediation Sampling

Number: SL-048

Revision: 1

Final Draft: October 3, 1997

Contact Name: Eric Kroger

Approval: William D. Kelley
William D. Kelley
DQO Coordinator

Date: 10-3-97

Approval: [Signature]
for Joan White
Project Lead

Date: 10/03/97

Rev. #	0	1	2	3	4	5	6
Effective Date:	9/19/97						

DATA QUALITY OBJECTIVES

Delineating the Extent of Constituents of Concern in Pre-design Investigation and Remediation Sampling

Members of Data Quality Objectives (DQO) Scoping Team

The members of the DQO team include a project lead, a project engineer, a field lead, a statistician, a lead chemist, a sampling supervisor, and a data management lead.

Conceptual Model of the Site

Media is considered contaminated if the concentration of a constituent of concern (COC) exceeds the final remediation levels (FRLs). The extent of specific media contamination was estimated and published in the Operable Unit 5 Feasibility Study (FS). These estimates were based on kriging analysis of available data for media collected during the Remedial Investigation (RI) effort and other FEMP environmental characterization studies. Maps outlining contaminated media boundaries were generated for the Operable Unit 5 FS by overlaying the results of the kriging analysis data with isoconcentration maps of the other constituents of concern (COCs), as presented in the Operable Unit 5 RI report, and further modified by spatial analysis of maps reflecting the most current media characterization data. A sequential remediation plan has been presented that subdivides the FEMP into seven construction areas. During the course of remediation, areas of specific media may require additional characterization so remediation can be carried out as thoroughly and efficiently as possible. As a result, additional sampling may be necessary to accurately delineate a volume of specific media as exceeding a target level, such as the FRL or the Waste Attainment Criterion (WAC). Each individual Project-Specific Plan (PSP) will identify and describe the particular media to be sampled.

1.0 Statement of Problem

If the extent (depth and/or area) of the media COC contamination is unknown, then it must be defined with respect to the appropriate target level (FRL, WAC, or other specified media concentration).

2.0 Identify the Decision

Delineate the horizontal and/or vertical extent of media COC contamination in an area with respect to the appropriate target level.

3.0 Inputs That Affect the Decision

Informational Inputs - Historical data, process history knowledge, the modeled extent of COC contamination, and the origins of contamination will be required to establish a sampling plan to delineate the extent of COC contamination. The desired precision of the delineation must be weighed against the cost of collecting and analyzing additional samples in order to determine the optimal sampling density. The project-

specific plan will identify the optimal sampling density.

Action Levels - COCs must be delineated with respect to a specific action level, such as FRLs and On-Site Disposal Facility (OSDF) WAC concentrations. Specific media FRLs are established in the OU2 and OU5 RODs, and the WAC concentrations are published in the OU5 ROD. Media COCs may also require delineation with respect to other action levels that act as remediation drivers, such as Benchmark Toxicity Values (BTVs) and As Low As Reasonably Achievable (ALARA) levels.

4.0 The Boundaries of the Situation

Temporal Boundaries - Sampling must be completed within a time frame sufficient to meet the remediation schedule. Time frames must allow for the scheduling of sampling and analytical activities, the collection of samples, analysis of samples and the processing of analytical data when received.

Scale of Decision Making - The decision made based upon the data collected in this investigation will be the extent of COC contamination at or above the appropriate action level. This delineation will result in media contaminant concentration information being incorporated into engineering design, and the attainment of established remediation goals.

Parameters of Interest - The parameters of interest are the COCs that have been determined to require additional delineation before remediation design can be finalized with the optimal degree of accuracy.

5.0 Decision Rule

If existing data provide an unacceptable level of uncertainty in the COC delineation model, then additional sampling will take place to decrease the model uncertainty. When deciding what additional data is needed, the costs of additional sampling and analysis must be weighed against the benefit of reduced uncertainty in the delineation model, which will eventually be used for assigning excavation, or for other purposes.

6.0 Limits on Decision Errors

In order to be useful, data must be collected with sufficient areal and depth coverage, and at sufficient density to ensure an accurate delineation of COC concentrations. Analytical sensitivity and reproducibility must be sufficient to differentiate the COC concentrations below their respective target levels.

Types of Decision Errors and Consequences

Decision Error 1 - This decision error occurs when the decision maker determines that the extent of media contaminated with COCs above action levels is not as

extensive as it actually is. This error can result in a remediation design that fails to incorporate media contaminated with COC(s) above the action level(s). This could result in the re-mobilization of excavation equipment and delays in the remediation schedule. Also, this could result in media contaminated above action levels remaining after remediation is considered complete, posing a potential threat to human health and the environment.

Decision Error 2 - This decision error occurs when the decision maker determines that the extent of media contaminated above COC action levels is more extensive than it actually is. This error could result in more excavation than necessary, and this excess volume of materials being transferred to the OSDF, or an off-site disposal facility if contamination levels exceed the OSDF WAC.

True State of Nature for the Decision Errors - The true state of nature for Decision Error 1 is that the maximum extent of contamination above the FRL is more extensive than was determined. The true state of nature for Decision Error 2 is that the maximum extent of contamination above the FRL is not as extensive as was determined. Decision Error 1 is the more severe error.

7.0 Optimizing Design for Usable Data

7.1 Sample Collection

A sampling and analytical testing program will delineate the extent of COC contamination in a given area with respect to the action level of interest. Existing data, process knowledge, modeled concentration data, and the origins of contamination will be considered when determining the lateral and vertical extent of sample collection. The cost of collecting and analyzing additional samples, will be weighed against the benefit of reduced uncertainty in the delineation model. This will determine the sampling density. Individual PSPs will identify the locations and depths to be sampled, the sampling density necessary to obtain the desired accuracy of the delineation, and if samples will be analyzed by the on-site or off-site laboratory. The PSP will also identify the sampling increments to be selectively analyzed for concentrations of the COC(s) of interest, along with field work requirements. Analytical requirements will be listed in the PSP. The chosen analytical methodologies are able to achieve a detection limit capable of resolving the COC action level. For real-time methodologies, the field data will be used to bias the physical sampling necessary for COC delineation.

7.2 COC Delineation

The media COC delineation will use all data collected under the PSP, and if deemed appropriate by the Project Lead, may also include existing data obtained from physical samples, and if applicable, information obtained through real-time screening. The delineation may be accomplished through modeling (e.g. kriging) of the COC concentration data with a confidence limit specific to project needs that will reduce

the potential for Decision Error 1. A very conservative approach to delineation may be utilized, where the boundaries of the contaminated media are extended to the first known vertical and horizontal sample locations that reveal concentrations below the desired action level.

7.3 QC Considerations

Laboratory work will follow the requirements specified in the SCQ. If analysis is to be carried out by an off-site laboratory, it will be a Fluor Daniel Fernald approved full service laboratory. Laboratory quality control measures include a media prep blank, a laboratory control sample (LCS), matrix duplicates and matrix spike.

Typical Field QC samples are not required for ASL B analysis. However the PSPs may specify appropriate field QC samples for the media type with respect to the ASL in accordance with the SCQ, such as field blanks, trip blanks, and container blanks. All field QC samples will be analyzed at the associated field sample ASL. The frequency of field QC sampling is as follows: Duplicate samples will be taken at a minimum of one per 20 samples. Rinsates will be performed at a minimum of one per 20 on all field equipment that is re-used. Trip blanks will be taken at a minimum of one per shipping container when analyzing for volatile organic compounds (VOCs). For VOCs, container blanks will be taken at a minimum of one per Area and Phase per container type (i.e. stainless steel core liner/plastic core liner/Geoprobe tube) when using uncertified containers. Field blanks are not necessary for soil metal analysis, as it is unlikely in ambient field conditions to have metals cross contamination, however, the probability of cross contamination with liquid samples and semi-volatile organic compounds is much higher, therefore for liquid samples and samples that will be analyzed for semi-volatile organic compounds (SVOCs) field blanks will be taken at a minimum of one per 20 samples. ASL and validation requirements are as follows:

- Real-time data will be analyzed to ASL A, and no field QC samples are required.
- If physical samples are analyzed for Pre-design Investigations and/or Pre-certification delineations, 100% of the data will be analyzed per ASL B requirements. 90% of the data will require only a Certificate of Analysis, the other 10% will require the Certificate of Analysis and all associated QA/QC results, and will be validated to ASL B.
- If samples are analyzed for WAC Attainment and/or RCRA Characteristic Areas Delineation, 100% of the data will be analyzed and reported to ASL B. The ASL B package will include a Certificate of Analysis along with all associated QA/QC results. In addition, 10% of the data will be validated to ASL B.
- If delineation data are also to be used for Certification, all data will be analyzed and reported to ASL D, and 10% will be validated to ASL D. In addition, the data must meet the data quality objectives specified in the Certification DQO.

All data will undergo an evaluation by the Project Team, including a comparison for consistency with historical data. Deviations from QC considerations resulting from evaluating inputs to the decision from Section 3, must be justified in the PSP such that the objectives of the decision rule in Section 5 are met.

7.4 Independent Assessment

Independent assessment shall be performed by the FEMP QA organization by conducting surveillances. Surveillances will be planned and documented in accordance with Section 12.3 of the SCQ.

7.5 Data Management

Upon receipt from the laboratory, all results will be entered into the SED as qualified data using standard data entry protocol. The required ASL B data will undergo analytical validation by the FEMP validation team. A minimum of ten percent (10%) of field data will be validated by the FEMP QA validation team. The Project Manager will be responsible to determine data usability as it pertains to supporting the DQO decision of determining decontamination of media COC's.

7.6 Applicable Procedures

Sample collection will be described in the PSP with a listing of applicable procedures. Typical related plans and procedures are the following:

- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ).
- SMPL-01, *Solids Sampling*
- SMPL-21, *Collection of Field Quality Control Samples*
- EQT-06, *Geoprobe® Model 5400 Operation and Maintenance*
- EQT-23, *Operation of ADCAM Series Analyzers with Gamma Sensitive Detectors*
- EQT-30, *Operation of Radiation Tracking Vehicle Sodium Iodide Detection System*

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Data Quantity Objectives
Delineating the Extent of Media Constituents of Concern

1.A. Task/Description: Delineating the extent of contamination above the FRLs

1.B. Project Phase: (Put an X in the appropriate selection.)

RI ☐ FS ☐ RD ☒ RA ☐ R/A ☐ OTHER ☐

1.C. DDO No.: SL-048, Rev. 1 DDC Reference No.: _____

2. Media Characterization: (Put an X in the appropriate selection.)

Air ☐ Biological ☐ Groundwater ☒ Sediment ☒ Soil ☒
Waste ☒ Wastewater ☐ Surface water ☐ Other (specify) _____

3. Data Use with Analytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable Data Use.)

Site Characterization

A ☒ B ☒ C ☐ D ☒ E ☐

Risk Assessment

A ☐ B ☐ C ☐ D ☐ E ☐

Evaluation of Alternatives

A ☐ B ☐ C ☐ D ☐ E ☐

Engineering Design

A ☒ B ☒ C ☐ D ☒ E ☐

Monitoring during remediation

A ☒ B ☒ C ☐ D ☒ E ☐

Other

A ☐ B ☐ C ☐ D ☐ E ☐

4.A. Drivers: Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and the OU22 and/or OU5 Record of Decision (ROD).

4.B. Objective: Delineate the extent of media contaminated with a COC (or COCs) with respect to the action level(s) of interest.

5. Site Information (Description):

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6.A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

- | | | | | |
|--|---|---|---|-------------------------------------|
| 1. pH <input checked="" type="checkbox"/> | • | 2. Uranium <input checked="" type="checkbox"/> | • | 3. BTX <input type="checkbox"/> |
| Temperature <input checked="" type="checkbox"/> | • | Full Radiological <input checked="" type="checkbox"/> | • | TPH <input type="checkbox"/> |
| Specific Conductance <input checked="" type="checkbox"/> | • | Metals <input checked="" type="checkbox"/> | • | Oil/Grease <input type="checkbox"/> |
| Dissolved Oxygen <input checked="" type="checkbox"/> | • | Cyanide <input type="checkbox"/> | • | |
| Technetium-99 <input checked="" type="checkbox"/> | • | Silica <input type="checkbox"/> | • | |
| 4. Cations <input type="checkbox"/> | | 5. VOA <input checked="" type="checkbox"/> | • | 6. Other (specify) |
| Anions <input type="checkbox"/> | | BNA <input checked="" type="checkbox"/> | • | |
| TOC <input type="checkbox"/> | | Pesticides <input checked="" type="checkbox"/> | • | |
| TCLP <input checked="" type="checkbox"/> | • | PCB <input checked="" type="checkbox"/> | • | |
| CEC <input type="checkbox"/> | | COD <input type="checkbox"/> | • | |

*If constituent is identified for delineation in the individual PSP.

6.B. Equipment Selection and SCQ Reference:

Equipment Selection	Refer to SCQ Section
ASL A <u>X</u> <u>RTRAK / HPGc / XRF</u>	SCQ Section: <u>Not Applicable</u>
ASL B <u>X</u>	SCQ Section: <u>App. G Tables G-1&G-3</u>
ASL C _____	SCQ Section: _____
ASL D <u>X</u>	SCQ Section: <u>App. G Tables G-1&G-3</u>
ASL E _____	SCQ Section: _____

7.A. Sampling Methods: (Put an X in the appropriate selection.)

Biased ☒ Composite ☐ Environmental ☒ Grab ☒ Grid ☒
Intrusive ☒ Non-Intrusive ☐ Phased ☐ Source ☐

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7.B. Sample Work Plan Reference: This DQO is being written prior to the PSPs.

Background samples: QU5 RI

000032

7.C. Sample Collection Reference:

Sample Collection Reference: SMPL-01, EQT-06

8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

Trip Blanks	<input checked="" type="checkbox"/>	Container Blanks	<input checked="" type="checkbox"/>
Field Blanks	<input checked="" type="checkbox"/>	Duplicate Samples	<input checked="" type="checkbox"/>
Equipment Rinse Samples	<input checked="" type="checkbox"/>	Split Samples	<input checked="" type="checkbox"/>
Preservative Blanks	<input type="checkbox"/>	Performance Evaluation Samples	<input type="checkbox"/>
Other (specify)			

*For volatile organics only

- Split samples will be collected where required by EPA or OEPA.
- Taken at the discretion of the Project Manager (if warranted by field conditions)
- One per Area and Phase per container type (i.e. stainless steel core liner/ plastic core liner/Geoprobe tube).

8.B. Laboratory Quality Control Samples:

Method Blank	<input checked="" type="checkbox"/>	Matrix Duplicate/Replicate	<input checked="" type="checkbox"/>
Matrix Spike	<input checked="" type="checkbox"/>	Surrogate Spikes	<input type="checkbox"/>
Tracer Spike	<input type="checkbox"/>		

Other (specify) Per SCO

9. Other: Please provide any other germane information that may impact the data quality or gathering of this particular objective, task or data use.

APPENDIX B

**SOIL SAMPLES COLLECTED FOR THE AREA 3 NORTHEAST
CORNER INVESTIGATION**

APPENDIX B
Soil Samples for the Area 3 Northeast Corner Investigation¹

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample Identification Number	Target Analyte²
12242	1350425	481550	0'-1'	A3NECOR-12242-1	Total Uranium
			1'-2'	A3NECOR-12242-2	Total Uranium
			3'-4'	A3NECOR-12242-4	Total Uranium
			5'-6'	A3NECOR-12242-6	Total Uranium
			7'-8'	A3NECOR-12242-8	Total Uranium
			11'-12'	A3NECOR-12242-12	Total Uranium
			15'-16'	A3NECOR-12242-16	Total Uranium
			19'-20'	A3NECOR-12242-20	Total Uranium
			23'-24'	A3NECOR-12242-24	Total Uranium
12243	1350579	481464	0'-1'	A3NECOR-12243-1	Total Uranium
			1'-2'	A3NECOR-12243-2	Total Uranium
			3'-4'	A3NECOR-12243-4	Total Uranium
			5'-6'	A3NECOR-12243-6	Total Uranium
			7'-8'	A3NECOR-12243-8	Total Uranium
			11'-12'	A3NECOR-12243-12	Total Uranium
			15'-16'	A3NECOR-12243-16	Total Uranium
			19'-20'	A3NECOR-12243-20	Total Uranium
			23'-24'	A3NECOR-12243-24	Total Uranium
12244	1350567.8	481578.9	0'-1'	A3NECOR-12244-1	Total Uranium
			1'-2'	A3NECOR-12244-2	Total Uranium
			3'-4'	A3NECOR-12244-4	Total Uranium
			5'-6'	A3NECOR-12244-6	Total Uranium
			7'-8'	A3NECOR-12244-8	Total Uranium
			11'-12'	A3NECOR-12244-12	Total Uranium
			15'-16'	A3NECOR-12244-16	Total Uranium
			19'-20'	A3NECOR-12244-20	Total Uranium
			23'-24'	A3NECOR-12244-24	Total Uranium
12245	1350553.8	481800.9	0'-1'	A3NECOR-12245-1	Total Uranium
			1'-2'	A3NECOR-12245-2	Total Uranium
			3'-4'	A3NECOR-12245-4	Total Uranium
			5'-6'	A3NECOR-12245-6	Total Uranium
			7'-8'	A3NECOR-12245-8	Total Uranium
			11'-12'	A3NECOR-12245-12	Total Uranium
			15'-16'	A3NECOR-12245-16	Total Uranium
			19'-20'	A3NECOR-12245-20	Total Uranium
			23'-24'	A3NECOR-12245-24	Total Uranium

¹ Any sample collected as an archive sample will include a "-v" suffix on the sample identifier.

² Note that total uranium results will be calculated from analysis of uranium-238.

APPENDIX B (Continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample Identification Number	Target Analytes ¹
12246	1350555.5	481900	0'-1'	A3NECOR-12246-1	Total Uranium
			1'-2'	A3NECOR-12246-2	Total Uranium
			3'-4'	A3NECOR-12246-4	Total Uranium
			5'-6'	A3NECOR-12246-6	Total Uranium
			7'-8'	A3NECOR-12246-8	Total Uranium
			11'-12'	A3NECOR-12246-12	Total Uranium
			15'-16'	A3NECOR-12246-16	Total Uranium
			19'-20'	A3NECOR-12246-20	Total Uranium
			23'-24'	A3NECOR-12246-24	Total Uranium
12247	1350555.5	481986.8	0'-1'	A3NECOR-12247-1	Total Uranium
			1'-2'	A3NECOR-12247-2	Total Uranium
			3'-4'	A3NECOR-12247-4	Total Uranium
			5'-6'	A3NECOR-12247-6	Total Uranium
			7'-8'	A3NECOR-12247-8	Total Uranium
			11'-12'	A3NECOR-12247-12	Total Uranium
			15'-16'	A3NECOR-12247-16	Total Uranium
			19'-20'	A3NECOR-12247-20	Total Uranium
			23'-24'	A3NECOR-12247-24	Total Uranium
12248	1350594.6	482169.7	0'-1'	A3NECOR-12248-1	Total Uranium
			1'-2'	A3NECOR-12248-2	Total Uranium
			3'-4'	A3NECOR-12248-4	Total Uranium
			5'-6'	A3NECOR-12248-6	Total Uranium
			7'-8'	A3NECOR-12248-8	Total Uranium
			11'-12'	A3NECOR-12248-12	Total Uranium
			15'-16'	A3NECOR-12248-16	Total Uranium
			19'-20'	A3NECOR-12248-20	Total Uranium
			23'-24'	A3NECOR-12248-24	Total Uranium
12249	1350488.7	482163.9	0'-1'	A3NECOR-12249-1	Total Uranium
			1'-2'	A3NECOR-12249-2	Total Uranium
			3'-4'	A3NECOR-12249-4	Total Uranium
			5'-6'	A3NECOR-12249-6	Total Uranium
			7'-8'	A3NECOR-12249-8	Total Uranium
			11'-12'	A3NECOR-12249-12	Total Uranium
			15'-16'	A3NECOR-12249-16	Total Uranium
			19'-20'	A3NECOR-12249-20	Total Uranium
			23'-24'	A3NECOR-12249-24	Total Uranium

¹ Any sample collected as an archive sample will include a "-v" suffix on the sample identifier.

² Note that total uranium results will be calculated from analysis of uranium-238.

APPENDIX B (Continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample Identification Number	Target Analytes ²
12250	1350130.3	482028.9	0'-1'	A3NECOR-12250-1	Total Uranium
			1'-2'	A3NECOR-12250-2	Total Uranium
			3'-4'	A3NECOR-12250-4	Total Uranium
			5'-6'	A3NECOR-12250-6	Total Uranium
			7'-8'	A3NECOR-12250-8	Total Uranium
			11'-12'	A3NECOR-12250-12	Total Uranium
			15'-16'	A3NECOR-12250-16	Total Uranium
			19'-20'	A3NECOR-12250-20	Total Uranium
			23'-24'	A3NECOR-12250-24	Total Uranium
12251	1350301	481842.1	0'-1'	A3NECOR-12251-1	Total Uranium
			1'-2'	A3NECOR-12251-2	Total Uranium
			3'-4'	A3NECOR-12251-4	Total Uranium
			5'-6'	A3NECOR-12251-6	Total Uranium
			7'-8'	A3NECOR-12251-8	Total Uranium
			11'-12'	A3NECOR-12251-12	Total Uranium
			15'-16'	A3NECOR-12251-16	Total Uranium
			19'-20'	A3NECOR-12251-20	Total Uranium
			23'-24'	A3NECOR-12251-24	Total Uranium
12252	1350446.3	481761.1	0'-1'	A3NECOR-12252-1	Total Uranium
			1'-2'	A3NECOR-12252-2	Total Uranium
			3'-4'	A3NECOR-12252-4	Total Uranium
			5'-6'	A3NECOR-12252-6	Total Uranium
			7'-8'	A3NECOR-12252-8	Total Uranium
			11'-12'	A3NECOR-12252-12	Total Uranium
			15'-16'	A3NECOR-12252-16	Total Uranium
			19'-20'	A3NECOR-12252-20	Total Uranium
			23'-24'	A3NECOR-12252-24	Total Uranium
12253	1350475.3	481812.1	0'-1'	A3NECOR-12253-1	Total Uranium
			1'-2'	A3NECOR-12253-2	Total Uranium
			3'-4'	A3NECOR-12253-4	Total Uranium
			5'-6'	A3NECOR-12253-6	Total Uranium
			7'-8'	A3NECOR-12253-8	Total Uranium
			11'-12'	A3NECOR-12253-12	Total Uranium
12254	1350477.3	481771.1	0'-1'	A3NECOR-12254-1	Total Uranium
			1'-2'	A3NECOR-12254-2	Total Uranium
			3'-4'	A3NECOR-12254-4	Total Uranium
			5'-6'	A3NECOR-12254-6	Total Uranium
			7'-8'	A3NECOR-12254-8	Total Uranium
			11'-12'	A3NECOR-12254-12	Total Uranium

¹ Any sample collected as an archive sample will include a "-v" suffix on the sample identifier.

² Note that total uranium results will be calculated from analysis of uranium-238.

APPENDIX B (Continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample Identification Number	Target Analytes ²
12255	1350408.4	481718.1	0'-1'	A3NECOR-12255-1	Total Uranium
			1'-2'	A3NECOR-12255-2	Total Uranium
			3'-4'	A3NECOR-12255-4	Total Uranium
			5'-6'	A3NECOR-12255-6	Total Uranium
			7'-8'	A3NECOR-12255-8	Total Uranium
			11'-12'	A3NECOR-12255-12	Total Uranium
12256	1350481.3	481699.1	0'-1'	A3NECOR-12256-1	Total Uranium
			1'-2'	A3NECOR-12256-2	Total Uranium
			3'-4'	A3NECOR-12256-4	Total Uranium
			5'-6'	A3NECOR-12256-6	Total Uranium
			7'-8'	A3NECOR-12256-8	Total Uranium
			11'-12'	A3NECOR-12256-12	Total Uranium
12257	1350420.4	481656.2	0'-1'	A3NECOR-12257-1	Total Uranium
			1'-2'	A3NECOR-12257-2	Total Uranium
			3'-4'	A3NECOR-12257-4	Total Uranium
			5'-6'	A3NECOR-12257-6	Total Uranium
			7'-8'	A3NECOR-12257-8	Total Uranium
			11'-12'	A3NECOR-12257-12	Total Uranium
12258	1350409.4	481622.2	0'-1'	A3NECOR-12258-1	Total Uranium
			1'-2'	A3NECOR-12258-2	Total Uranium
			3'-4'	A3NECOR-12258-4	Total Uranium
			5'-6'	A3NECOR-12258-6	Total Uranium
			7'-8'	A3NECOR-12258-8	Total Uranium
			11'-12'	A3NECOR-12258-12	Total Uranium
12259	1350437.4	481616.2	0'-1'	A3NECOR-12259-1	Total Uranium
			1'-2'	A3NECOR-12259-2	Total Uranium
			3'-4'	A3NECOR-12259-4	Total Uranium
			5'-6'	A3NECOR-12259-6	Total Uranium
			7'-8'	A3NECOR-12259-8	Total Uranium
			11'-12'	A3NECOR-12259-12	Total Uranium
12260	1350537.2	481667.2	0'-1'	A3NECOR-12260-1	Total Uranium
			1'-2'	A3NECOR-12260-2	Total Uranium
			3'-4'	A3NECOR-12260-4	Total Uranium
			5'-6'	A3NECOR-12260-6	Total Uranium
			7'-8'	A3NECOR-12260-8	Total Uranium
			11'-12'	A3NECOR-12260-12	Total Uranium

¹ Any sample collected as an archive sample will include a "-v" suffix on the sample identifier.² Note that total uranium results will be calculated from analysis of uranium-238.

APPENDIX B (Continued)

Boring Number	Northing Coordinate	Easting Coordinate	Sample Depth	Sample Identification Number	Target Analytes ²
12261	1350537.2	481642.2	0'-1'	A3NECOR-12261-1	Total Uranium
			1'-2'	A3NECOR-12261-2	Total Uranium
			3'-4'	A3NECOR-12261-4	Total Uranium
			5'-6'	A3NECOR-12261-6	Total Uranium
			7'-8'	A3NECOR-12261-8	Total Uranium
			11'-12'	A3NECOR-12261-12	Total Uranium
12262	1350512.3	481594.2	0'-1'	A3NECOR-12262-1	Total Uranium
			1'-2'	A3NECOR-12262-2	Total Uranium
			3'-4'	A3NECOR-12262-4	Total Uranium
			5'-6'	A3NECOR-12262-6	Total Uranium
			7'-8'	A3NECOR-12262-8	Total Uranium
			11'-12'	A3NECOR-12262-12	Total Uranium
12263	1350488.3	481854.1	0'-1'	A3NECOR-12263-1	Total Uranium
			1'-2'	A3NECOR-12263-2	Total Uranium
			3'-4'	A3NECOR-12263-4	Total Uranium
			5'-6'	A3NECOR-12263-6	Total Uranium
			7'-8'	A3NECOR-12263-8	Total Uranium
			11'-12'	A3NECOR-12263-12	Total Uranium

¹ Any sample collected as an archive sample will include a "-v" suffix on the sample identifier.

² Note that total uranium results will be calculated from analysis of uranium-238.

APPENDIX C
TARGET ANALYTE LISTS (TAL)

TARGET ANALYTE LISTS
AREA 3 NORTHEAST CORNER SAMPLING
Project Number 50.03.52.01

TAL A3NECOR-A

ICPMS Method		
1	ASL B	Total Uranium (via <i>Uranium-238</i>)

Pre-Design Investigation Sampling